Radiation Test Report

Latchup Testing of the TC55257 Toshiba 32Kx8 SRAM

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1. Introduction

Latchup testing of the TC55257DFI-85L (32Kx8) SRAM manufactured by Toshiba was carried out at TAMU on 28th March 2003 using heavy ions.

2. Parts Tested

The parts tested had lot codes P17356 and date codes 0030HAK.

3. Test Configuration

The part was tested under electrical bias (5V) and a current of 22 mA was measured. For latchup testing, a threshold at 80 mA was set. A current pulse greater than 80 mA signified a latchup condition provided the power had to be recycled to remove the high current condition. The part was not tested for functionality either before or after exposure to ions.

4. Test Conditions

The ions used for testing are shown in Table I.

Table I
Ions used for SEL Testing

Ion	Energy (MeV)	LET ($MeV.cm^2/mg$)
Xe	1366	53.1
Au	2006	87.1

Non-normal incidence was used for some of the runs to increase the effective LET. The parts were de-lidded for testing.

5. Results

The results are shown in Table II. No latchups were observed for LETs up to 123.18 $MeV.cm^2/mg$ and for fluences of 10^7 $ions/cm^2$.

Table II
Results of SEL Testing

Run #	Serial #	Ion	Energy (MeV)	LET ($MeV.cm^2/mg$)	Tilt (deg)	LET(eff) ($MeV.cm^2/mg$)	Fluence $\#/cm^2$	# of SELs	Cross Section
1	1	Xe	1366	53.1	0	53.1	10^7	0	0
2	1	Xe	1366	53.1	45	75.1	10^7	0	0
3	2	Xe	1366	53.1	0	53.1	10^7	0	0
4	2	Xe	1366	53.1	45	75.1	10^7	0	0
5	2	Au	2006	87.1	45	123.18	10^7	0	0
6	2	Au	2006	87.1	0	87.1	10^7	0	0
7	1	Au	2006	87.1	0	87.1	10^7	0	0
8	1	Au	2006	87.1	45	123.18	10^7	0	0

6. Conclusions

No SELs were observed during testing up to LET = 123.1 $MeV.cm^2/mg$ and a fluence of $1x10^7$ $ions/cm^2$. Therefore, the part is not sensitive to SELs.